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Appl. No.: 10/069,260

Confirmation No.: 1600

Applicant(s): Arnold

Filed: February 22, 2002

Art Unit: 2879

Examiner: J. L. Williams

Title: LIGHT SOURCE AND METHOD FOR PRODUCING A LIGHT SOURCE

Docket No.: 034691/243032

Customer No.: 00826

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF TRANSMITTAL
(PATENT APPLICATION - 37 C.F.R. § 41.37)

1. Transmitted herewith is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on August 16, 2004.
 2. ☐ Applicant claims small entity status.
 3. Pursuant to 37 C.F.R. § 41.20(b)(2), the fee for filing the Appeal Brief is:
☐ small entity \$165.00
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Appeal Brief fee due \$330.00
- ☒ Any additional fee or refund may be charged to Deposit Account 16-0605.

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In, re: Arnold

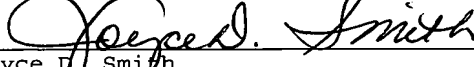
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CERTIFICATE OF MAILING

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Joyce D. Smith



Attorney's Docket No. 034691/243032

PATENT

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APPEAL BRIEF UNDER 37 CFR § 41.37

This Appeal Brief is filed pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed on August 16, 2004.

1. ***Real Party in Interest.***

The real party in interest in this appeal is IP2H AG of Bern, Switzerland, the assignee of the above-referenced patent application.

2. ***Related Appeals and Interferences.***

There are no related appeals and/or interferences involving this application or its subject matter.

3. ***Status of Claims.***

Claims 1-28, 31-33, 45, and 48-49 are cancelled.

Claims 29, 30, 34-44, 46, and 47 are rejected and appealed.

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4. ***Status of Amendments.***

An Amendment After Final Action was filed on May 20, 2004, and the amendments to the claims presented therein have been entered, note the Advisory Action of July 13, 2004.

5. ***Summary of Claimed Subject Matter.***

To briefly summarize, the invention as set forth in the sole base Claim 29 is directed to a light source, such as an incandescent lamp, which comprises a bulb 1, and a filament 2 arranged in the bulb, with the filament being heated by a heating device 3 so that it emits both visible light and heat radiation. To provide improved operating efficiency, a dielectric multilayer coating 7 is applied to the inner surface of the bulb, with the coating being designed to be spectrally selective so as to substantially reflect the heat radiation while being substantially transparent to the visible light. Further, to permit better absorption of the reflected heat radiation, the filament 2 is configured to be in the form of a flat section 4, which is defined in the specification to include a broad surface which may be either planar or curved, note the paragraphs added to page 14, between lines 23 and 24, by the Preliminary Amendment filed April 17, 2002.

The heating device 3 as recited in Claim 29 may be considered a means plus function recitation under 35 USC §112P6, which includes the power supply conductors 5 and electrical contacts 6, note page 13, lines 18-20.

The fact that the filament is in the form of a flat section is an important aspect of the present invention, since the flat section provides significantly improved absorption of the reflected heat radiation, as compared to a filament with the conventional spiral wire form. As pointed out in the paragraph beginning at page 3, line 10 of the specification,

the large filament surface provided by the flat section materially contributes to the highest possible backheating of the filament and a high efficiency in converting the electrical power into visible light.

Base Claim 29 further recites that the filament comprises tantalum carbide, which may be in the form of a coating. Such material renders it possible to achieve during operation surface temperatures which are higher than is usual for a conventional tungsten filament, note page 5, lines 5-27 of the specification of the present application.

Dependent Claim 30 adds that the filament comprises a sintered metal powder. This feature is important in that the use of such material effectively responds to the problem that the electrical resistance of the filament would normally become smaller when the surface is enlarged, note the paragraph beginning at page 3, line 32 of the specification and the following paragraph which begins on page 4. By employing a sintered metal, an increased electrical resistance is achieved and also the mechanical strength is improved.

Dependent Claims 34 and 35 are specific to an embodiment wherein the filament includes a coating which has a higher melt temperature than the filament material. As explained in the paragraph beginning at page 5, line 5, such a coating could be employed in association with a body of sintered metal to achieve higher filament temperatures than would otherwise be possible.

Dependent Claim 36 is specific to a preferred configuration of the filament and wherein the flat section 4 of the filament comprises a strip composed of two longitudinal sides 9 as best seen in Fig. 2. Claims 37 and 38 depend from Claim 36 and add that the flat section also has surface elements 10 projecting along the opposite sides 9 in the

manner of wings. This configuration is novel and advantageous in that it facilitates the construction of the filament, note the paragraph beginning at page 5, line 28 of the specification. Dependent Claims 46-47 are directed to this same embodiment, but further define the flat section 4 of the filament 2 as being of inverted U-shaped configuration to define the two longitudinal sides 9. The inverted U-shaped configuration is also shown in Fig. 2 of the drawings.

Dependent Claims 40-43 are specific to an alternative embodiment of the configuration of the filament 2, wherein the filament is in the shape of a cylindrical jacket as shown in Figs. 4 and 5 of the drawings. This configuration is further described in the paragraph beginning at page 6, line 9 of the specification.

6. *Grounds of Rejection to be Reviewed on Appeal.*

The grounds of rejection as set forth below have been restated as compared to the rejections set forth in the final rejection, to take into account the entry of the Amendment After Final Action.

A. Claims 29, 34, 35, 36, 39, and 44 are unpatentable over McGuire (US 5,666,017) in view of Noll (US 6,555,948) and Bird (US 3,237,284) under §103(a) of the Patent Statute.

B. Claim 30 is unpatentable over McGuire in view of Noll and further in view of Koo (US 3,927,989) under §103(a) of the Patent Statute.

C. Claims 37, 38, 46, and 47 are unpatentable over McGuire in view of Noll and further in view of Pirani (US 1,726,365) under §103(a) of the Patent Statute.

D. Claims 29 and 40-43 are unpatentable over McGuire in view of Almer (US 4,144,473) under §103(a) of the Patent Statute.

7. **Argument.**

A. The rejection of Claims 29, 34, 35, 36, 39, and 44

In rejecting the indicated claims, the Examiner has proposed a combination of selected features of McGuire '017, Noll '948, and Bird '948. Figs. 19 and 20 of the McGuire patent disclose a lamp composed of a spiral filament 602 which is positioned within an envelope 604. The envelope is coated at 620 to reflect the infrared energy back to the filament 602. McGuire does not disclose a filament which includes a flat section. For this feature, the Examiner has turned to the Noll patent which discloses a flat, "strip shaped" filament 15 which may be of a multi-layer design (column 5, lines 23-26), and which is supported in the lamp by a spring 24. The Examiner has proposed that the flat filament 15 of Noll could be substituted for the spiral filament 602 of McGuire.

It is submitted that such a substitution would not be suggested, since McGuire specifically teaches that the configuration of the filament 602, and its placement within the lamp envelop 604, are critical to the desired operation of the lamp. More particularly, McGuire teaches that in the embodiment of Fig. 19, the filament 602 should be centrally disposed within the envelope 604 in all of the X, Y, and Z axes, note column 18, lines 30-56. The flat filament 15 and supporting spring 24 of Noll could not be positioned in the envelope 604 to maintain the central location as taught by McGuire. The proposed combination would in fact be contrary to the express teachings of McGuire, and one skilled in the art would not have attempted the combination.

Also, the proposed combination of McGuire and Noll is not seen to be suggested by the references themselves, since there

is no apparent reason for the proposed combination. For example, there is nothing in the Noll patent which would suggest the important benefits and advantages of using a flat filament in a bulb having a spectrally selective reflective coating on the inner surface of the bulb in the manner of the present invention. In the absence of such a suggestion or incentive, the proposed combination is legally untenable and cannot be sustained. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 USPQ 929-933 (Fed. Cir. 1984).

The Bird patent discloses a filament 30 composed of a core wire 32 and a helically wound fine wire 34, which are both formed of a material which comprises a major percentage of tantalum carbide. However, the disclosure of this patent is otherwise unrelated to a lamp with a flat filament and reflective surfaces as claimed, and there is no suggestion for this further modification of McGuire as proposed by the Examiner. Nor does Bird supply the deficiencies of the proposed combination of McGuire and Noll as set forth above.

Dependent Claims 34 and 35 recite that the filament is coated with a coating material which has a higher melt temperature than the filament. In the Official Action of March 12, 2004, the Examiner has asserted that Bird teaches that the filament is coated with a coating material. However, the basis for this assertion is not apparent from the Bird disclosure, and it is submitted that the claimed "coating" is not suggested by any of the three cited references.

Dependent Claim 36 recites that the flat section of the filament comprises a strip with two longitudinal sides. This claimed construction is illustrated in Fig. 2 of the application, which shows the two longitudinal sides within the meaning of the claim language at 9. The Examiner has not made any specific comments as to how the cited references may be

applied to support the rejection of this claim, and it is submitted that in fact, none of the cited references teach or suggest this feature.

B. The rejection of Claim 30

Dependent Claim 30 is directed to the feature of utilizing a sintered metal powder in constructing the filament. The important and unexpected advantages of using sintered metal in association with a flat filament as noted above, i.e. the ability to compensate for the reduced electrical resistance in the flat filament, would not have been recognized or appreciated from the references themselves.

In rejecting Claim 30, the Examiner has turned to the patent to Koo '989, in combination with McGuire and Noll. The Koo patent is directed to a specific problem of "sag" in tungsten lamp filaments which are in the form of wire coils and heated to operating temperatures, note column 1, lines 8-13. To alleviate this problem, Koo teaches that a tungsten powder, which is doped with an alkali metal, may be heated to develop internal bubbles of microscopic size (column 3, lines 56-59), and the mixture is then pressed into bars and sintered. To reduce bubble migration, Koo teaches that a dispersion of submicroscopic second phase particles may be added to the doped tungsten (column 5, lines 15-20).

It is submitted that the problem being addressed by Koo, i.e., the "sagging" of lamp filaments which are in the form of a wire coil, is so fundamentally distinct from the problem to which the present invention is directed, i.e. providing a lamp with improved energy conversion efficiency, that "a person of ordinary skill in the art to which the subject matter pertains" (35 USC 103(a)) would not have considered Koo to be helpful in solving the latter problem. Indeed, in view of the

different problems being addressed, the Koo disclosure would be considered non-analogous to the subject matter of the present invention.

C. The Rejection of Claims 37, 38, 46, and 47

Claims 37-38 and 46-67 are directed to the specific configuration of the filament shown in Figs. 1-3 of the application and as described above. To reject these claims, the Examiner has turned to Pirani '365, which discloses several embodiments of a filament having a corrugated or zigzag shape in cross section. However, these configurations are not suggestive of a filament in the form of "a strip with two longitudinal sides" as recited in Claim 36 (from which Claims 37 and 38 depend) and as illustrated in Fig. 2 of the application drawings. Thus even when considered collectively, the three cited references do not disclose or suggest the invention of Claims 37-38.

Claims 46 and 47 are further distinguishable from the cited prior patents. Specifically, these two claims more specifically define the embodiment of the filament as seen in Figs. 1-3 and wherein the filament has, *inter alia*, an inverted U-shaped configuration as seen in Fig. 2. Pirani discloses nothing similar to the claimed configuration, and thus here again, even when the cited references are considered collectively, the claimed invention would not result.

D. The Rejection of Claims 29 and 40-43

Claims 29 and 40-43 were rejected under §103 upon a proposed combination of McGuire and Almer '473. The Almer patent discloses an incandescent lamp 80 in Fig. 10 which includes a hollow cylindrical filament 81 of a highly technical configuration. Specifically, and as seen in the

embodiment of Fig. 9, the filament comprises a plurality of first electrically conductive strips 70 which extend in the circumferential direction, and with the strips 70 being interconnected by four second strips 71 which extend in the axial direction and so as to form electrically parallel current paths which are said to avoid "hot spots" (column 2, lines 27-29). With Almer being completely focused on a precise shape of the filament which provides a specifically desired result, it cannot be said that Almer would have suggested any modification of the lamp disclosed in the McGuire patent. Also, all of the embodiments of the filaments disclosed in the Almer patent are of openwork construction with a high degree of open spaces. It is not at all apparent that such openwork filaments could achieve the high absorption of reflected heat radiation which is an important feature of the claimed invention, and for that reason one skilled in the art would not have been led to attempt the substitution suggested by the Examiner.

Further, it will be noted that base Claim 29 now calls for the filament to include tantalum carbide. Thus even considering the McGuire and Almer patents collectively, the claimed invention would not result, and it would be necessary to apply a third reference to the modified structure resulting from a combination of McGuire and Almer. The prior patent to Bird is not capable of supplying this further modification, for the reasons presented above with respect to the rejection of the claims based upon the McGuire and Noll patents.

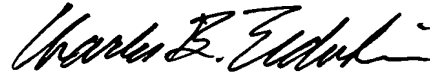
CONCLUSION

For the reasons set forth above, it is submitted that the Examiner's final rejection of Claims 29, 30, 34-44, 46, and 47

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is legally untentable and should be reversed. Such action is solicited.

Respectfully submitted,

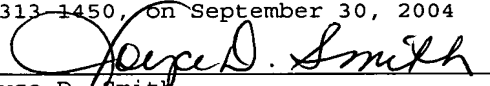


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Joyce D. Smith

APPENDIX

1.-28. (cancelled)

29. A light source comprising
a bulb having an inner surface and an outer surface,
a filament mounted within said bulb and which
includes a flat section, with said filament comprising
tantalum carbide,

a heating device for the filament whereby the
filament can be heated to cause the emission of both
visible light and heat radiation, and

a dielectric multilayer coating positioned entirely
on the inner surface of the bulb, said dielectric
multilayer coating being spectrally selective so as to
substantially reflect the heat radiation of the filament
while substantially transmitting the visible light
thereof.

30. The light source of Claim 29 wherein the
filament comprises a sintered metal powder.

31.-33. (cancelled)

34. The light source of Claim 29 wherein said
filament is coated with a coating material which has a
higher melt temperature than the filament.

35. The light source of Claim 34 wherein the
coating material on said filament is selected from the
group consisting of tantalum carbide, rhenium carbide,
niobium carbide, zirconium carbide, and mixtures thereof.

36. The light source of Claim 29 wherein the flat section of said filament comprises a strip with two longitudinal sides.

37. The light source of Claim 36 wherein two surface elements project from each of the respective longitudinal sides of the strip in the form of wings.

38. The light source of Claim 37 wherein each of the surface elements projects from the strip at an angle of about 90°.

39. The light source of Claim 29 wherein the flat section of the filament is substantially planar.

40. The light source of Claim 29 wherein the flat section of the filament is in the form of at least a portion of a cylindrical jacket.

41. The light source of Claim 40 wherein the at least a portion of a cylindrical jacket includes a lengthwise extending opening.

42. The light source of Claim 40 wherein the at least a portion of a cylindrical jacket defines a diameter which is smaller than a diameter defined by the bulb.

43. The light source of Claim 40 wherein the bulb defines a longitudinal axis, with the filament being configured to define a coaxial center axis.

44. The light source of Claim 29 wherein the heating device comprises a pair of electrical contacts

coupled to the filament for delivering an electrical current to the filament.

45. (cancelled)

46. The light source of Claim 29 wherein the flat section of the filament is of inverted U-shaped configuration to define two longitudinal sides which are almost back to back and which are integrally coupled at upper ends thereof, and wherein the heating device includes a pair of electrical contacts joined to respective ones of the longitudinal sides adjacent the opposite ends thereof.

47. The light source of Claim 46 wherein the two longitudinal sides are each in the form of a U-shaped channel section.

48.-49. (cancelled)

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